

51. (New) The computer program product of claim 47, wherein the updated control information is an excess burst size value.

52. (New) The computer program product of claim 47, wherein said analysis entity is a policy engine operable to analyze said portion of said information based upon selected guidelines to determine whether a performance of at least a portion of said network conforms with predetermined criteria.

53. (New) An apparatus for providing dynamic feedback control of network elements in a data network, the data network including a plurality of network elements, each of said network elements having a plurality operating parameters associated therewith, said operating parameters being related to at least one control parameter of said element, the apparatus comprising:

means for receiving information relating to characteristics associated with a first subset of the plurality of network elements;

means for providing at least a portion of said received information to at least one analysis entity for analyzing said portion of received data; and

means for providing updated control information to at least one of the network elements, wherein the updated control information is in response to the received information and specifies a limit on the operation of the at least one network element.

REMARKS

Claims 1-6, 10, 15, 16, 18, and 19 have been amended and claims 7-9, and 20-39 have been cancelled. No new matter is introduced by the amendments of these claims. The amendments of claims 1, 2, 3, 5, and 6 are supported on page 13, lines 16-24, among other places. New claims 40-53 have been added. Accordingly, claims 1-6, 10-19, and 40-53 remain pending.

The Examiner has objected to the Information Disclosure Statement (IDS) filed on 29 June 1999 for failing to include copies of U.S. patents. An IDS is filed herein, which IDS includes copies of references from the IDS submitted on 6/29/99. Thus, it is respectfully submitted that the IDS filed herein complies with 37 CFR 1.98(a)(2).

The abstract has been amended so that it meets the length requirements of MPEP 8608.01(b).

The Examiner has rejected claims 15 and 16 under 35 U.S.C. §112, second paragraph, as being indefinite as not providing antecedent basis for the limitation “the second subset of network elements.” Claims 15 and 16 have been amended to provide antecedent basis for such limitation.

The Examiner rejected claims 1-18, 20-32, 35-39 under 35 U.S.C. §102(e) as being anticipated by Abe (U.S. patent 6,108,304). The Examiner has also rejected claim 19 under 35 U.S.C. §103(a) as being unpatentable over Abe in view of Desai (US 5,781,703). Additionally, claims 33 and 34 are rejected under 35 U.S.C. §103(a) as being unpatentable over Abe. The Examiner’s rejections are respectfully traversed as follows.

Claim 1 is directed towards a method “for providing dynamic feedback control of network elements in a data network, the data network including a plurality of network elements, each of said network elements having a plurality operating parameters associated therewith, said operating parameters being related to at least one control parameter of said element.” Claim 1 also requires “receiving information relating to characteristics associated with a first subset of the plurality of network elements” and “providing at least a portion of said received information to at least one analysis entity for analyzing said portion of received data.” Claim 1 also requires “providing updated control information to at least one of the network elements, wherein the updated control information is in response to the received information and specifies a limit on the operation of the at least one network element.” For example, the updated control information may specify a committed information rate (CIR). Independent claims 40, 47, and 53 have a similar limitation regarding updated control information.

The primary reference Abe discloses a system having a network management equipment (200 of Fig. 1) which receives bandwidth values for routes connected to other network elements EA~ED (Fig. 1). The received bandwidth information is then used to calculate an available bandwidth for such routes, and this calculated available bandwidth information is sent to the network elements EA~ED so they can determine which routes to use based on the available bandwidths of such routes. See Column 7, lines 32-60 and Column 9, lines 1-12. In other words, the network management equipment merely lets the network elements know how much bandwidth is inherently available on each of its routes, rather than specifying a particular bandwidth limit for use by a particular network element or group of network elements, in the manner claimed. The available bandwidth inherently depends on how much bandwidth network elements are using for a particular route and is not *specified* or *limited* for a particular network element by the network management equipment, in the manner claimed. In other words, the network management equipment merely passes on information regarding a route to each network element, as opposed to *specifying a limit* regarding a route with respect to a particular network

element. Since Abe fails to teach or suggest “providing updated control information to at least one of the network elements, wherein the updated control information is in response to the received information and specifies a limit on the operation of the at least one network element”, it is respectfully submitted that claims 1, 40, 47, and 53 are patentable over Abe. The secondary reference Desai also fails to teach or suggest such limitation.

The Examiner’s rejections of the dependent claims are also respectfully traversed. However, to expedite prosecution, all of these claims will not be argued separately. Claims 2-6, 10-19, 41-46, and 48-52 each depend directly from independent claims 1, 40, or 47 and, therefore, are respectfully submitted to be patentable over cited art for at least the reasons set forth above with respect to claims 1, 40, and 47 . Further, the dependent claims require additional elements that when considered in context of the claimed inventions further patentably distinguish the invention from the cited art. For example, claims 2, 3, 5, and 6 require that the updated control information is a committed information rate value, an excess information rate value, a burst size value, and an excess burst size value, respectively. The cited references fail to teach or suggest such limitations.

Applicant believes that all pending claims are allowable and respectfully requests a Notice of Allowance for this application from the Examiner. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at the telephone number set out below.

Respectfully submitted,
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APPENDIX:
MARKED UP VERSION OF SPECIFICATION AND CLAIM AMENDMENTS

The Abstract has been amended as follows:

A feedback-based adaptive network is described wherein at least a portion of the network elements report operating information relating to network conditions to a centralized data store. The information which is reported to the data store is analyzed by a policy engine which includes a plurality of application specific plug-in policies for analyzing selected information from the data store and for computing updated control information based upon the analysis of the information. The updated control information is fed back to selected network elements to thereby affect operation of the selected elements. [Typically, when the operation of a network element has been affected, its corresponding operating information will change. The new or changed network element operating information is then reported to the data store and analyzed by the policy engine. The policy engine may then generate new or updated control information for affecting the operation of selected elements in the network. In this way, the dynamic and automatic feedback control of network elements is provided in order to allow the network to adapt to changing conditions. Events relating to changing conditions in the network may be reported to selected elements in the network using an event notification service.] Additionally the adaptive, feedback-based network of the present invention may include a network quality monitoring system for evaluating performance characteristics or other aspects of the network based upon predetermined standards or criteria. [If it is determined that a particular characteristic of the network does not conform with the standards established for that characteristic, the policy which controls that particular characteristic of the network may be automatically and dynamically modified to thereby affect the network performance.]

Claims 1-6, 10, 15, 16, 18, and 19 have been amended and claims 7-9, and 20-39 have been cancelled as follows:

1. (Amended Once) A method for providing dynamic feedback control of network elements in a data network, the data network including a plurality of network elements, each of said network elements having a plurality operating parameters associated therewith, said operating parameters being related to at least one control parameter of said element, said method comprising:

receiving information relating to characteristics associated with a first subset of the plurality of network elements; [and]

providing at least a portion of said received information to at least one analysis entity for analyzing said portion of received data; and

providing updated control information to at least one of the network elements, wherein the updated control information is in response to the received information and specifies a limit on the operation of the at least one network element.

2. (Amended Once) [A computer program product comprising a computer readable medium having computer code embodied therein for implementing the method of claim 1.] The method of claim 1, wherein the updated control information is a committed information rate value.

3. (Amended Once) The method of claim 1 [further including receiving updated control information in response to said information, said control information being usable by at least one network element to affect operation of said element.] wherein the updated control information is an excess information rate value.

4. (Amended Once) The method of claim [3] 1 wherein said analysis entity is a policy engine operable to analyze said portion of said information based upon selected guidelines to determine whether a performance of at least a portion of said network conforms with predetermined criteria.

5. (Amended Once) The method of claim [3] 1 [further including providing said received updated control information to an event notification system.] wherein the updated control information is a committed burst size value.

6. (Amended Once) The method of claim [5] 1 [further including automatically notifying said network element of said updated control information using said event notification system.] wherein the updated control information is an excess burst size value.

7. CANCELLED.

8. CANCELLED.

9. CANCELLED.

10. The method of claim 1 [further including providing] wherein the control data [to] is provided to a second subset of the plurality of network elements in response to the information[, the control data being for affecting operation of the second subset of network elements according to predefined criteria].

15. (Amended Once) The method of claim 10 wherein the second subset of network elements comprises the first subset of network elements.

16. (Amended Once) The method of claim 10 wherein the first subset of network elements comprises a first network element, and the second subset of network elements comprises a second network element.

18. (Amended Once) The method of claim 1[0] wherein receiving the information and providing the control data are performed by a single network controller.

19. (Amended Once) The method of claim 1[0] wherein receiving the information and providing the control data are performed by a plurality of network controllers.

20-39. CANCELLED.

ABSTRACT

A feedback-based adaptive network is described wherein at least a portion of the network elements report operating information relating to network conditions to a centralized data store. The information which is reported to the data store is analyzed by a policy engine which includes a plurality of application specific plug-in policies for analyzing selected information from the data store and for computing updated control information based upon the analysis of the information. The updated control information is fed back to selected network elements to thereby affect operation of the selected elements. Additionally the adaptive, feedback-based network of the present invention may include a network quality monitoring system for evaluating performance characteristics or other aspects of the network based upon predetermined standards or criteria.

Accompanying this Information Disclosure Statement is

- ☐ a statement as specified in 37 CFR 1.97(e); or
- ☒ the fee set forth in 37 CFR 1.17(p).

If fees are due, enclosed is our Check No. 6421 for \$180.00 in payment of the Information Disclosure Statement Fee. If it is determined that any additional fees are due, the Commissioner is hereby authorized to charge such fees to Deposit Account 500388 (Order No. CISCP111).

Respectfully submitted,

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